

Notice of Allowability

Application No.

09/925,743

Examiner

Akash Saxena

Applicant(s)

HAGIWARA ET AL.

Art Unit

2128

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 12/18/2006.
2. ☒ The allowed claim(s) is/are 1-13, 15-30 and 32-36.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

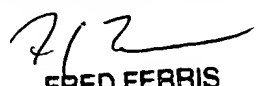
Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material

5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


FRED FERRIS
PRIMARY EXAMINER
TECHNOLOGY CENTER 2100

DETAILED ACTION

1. Claims 1-13, 15-30 and 32-36 are currently pending in this application based on applicant's amendment filed 18th December 2006.
2. Claims 35 and 36 are new.
3. Claims 1-13, 15-20, 22, 24 and 29 are amended.
4. Examiner withdraws the rejection under 35 USC 112 2nd paragraph in view of applicant's arguments and amendment to claims to clarify issues presented for claims 1, 7, 12, 18, 24 and 29.
5. Claims 1-13, 15-30, and 32-36 are now allowable.

Allowable Subject Matter

6. Claims 1-13, 15-30, and 32-36 have now been allowed over the prior art of record.

The following is an examiner's statement of reasons for allowance:

Regarding Claim 1-6

Applicants are disclosing a computer aided design (CAD) based system for simulating a shift control algorithm in the ECU with first and second simulator sections. A first model is used to estimate the effective hydraulic pressure and a second model is used to determine the transfer function describing the behavior of the hydraulic actuator. A third model is obtained from the first and second model such that the output (estimated effective hydraulic pressure) of the first model and second model converges.

The article "Object-Oriented Modeling for Gasoline Engine and Automatic

Transmission Systems" by K. Hong et al.: As shown in Hong the CAD based system

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is disclosed with a first model (Hong '1998: Pg.109, Pg.113, "AT Controller Module", Pg.109 3rd Paragraph and AT module). Hong does not first and second models converged to forms a third model.

U.S. Patent No. 5,885,188 issued to Naonori Iizuka: Iizuka teaches a first and second sections in an actual transmission to converge the effective hydraulic pressure values that would be applied to the hydraulic actuator therefore inferring a third section (Iizuka '188: Col.6, Lines 13-16; Fig.1, Elements 26-28, Col.1, Lines 28-37, Fig.1, Elements 26 & 13).

While these features are individually disclosed in the prior art, the prior art of record does not meet the conditions as suggested in MPEP section 2132, namely:

*"The identical invention must be shown in as complete detail as is contained in the ... claim."
Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).
The elements must be arranged as required by the claim, but this is not an **ipsissimis verbis** test, i.e., identity of terminology is not required. **In re Bond**, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990)."*

Hong and Iizuka do not teach the arrangement of elements as required by the claim.

In particular the prior art Iizuka is not a simulator that has two separate models forming a converged third model of a hydraulic system. Iizuka is a real automatic transmission control system and not a simulator/simulation or real time simulation. Commercial Software like MATLAB/SIMULINK, Adams/CAR are not found to same arrangements of multiple-models as in the disclosed claim (See attached prior art).

Regarding Claim 7-11

Applicants are disclosing a computer aided design (CAD) based system for simulating a shift control algorithm in the ECU. Besides the reasons presented in claim 1 for not teaching the combination of elements, claim 7 uses "mean for"

language and is further given deference in view of In re Donaldson and interpreted in view of 35 U.S.C. § 112 paragraph 6. The “means for” language and the limitations related thereto of claim 7 are interpreted within the scope of enablement as provided within the relative embodiment provided within applicant’s specification. Specifically, the “means for” language has been interpreted as defined in the embodiment of applicant’s specification as follows:

Transmission characteristic analyzing means as presented in specification (Pg. 30 Lines 26—Pg.31 Lines 2; Fig. 23 Step S22, Pg. 21 Lines 14-25, Pg. 22 Lines 15-28)

Parameter extracting means as presented in specification (Pg. 30 Lines 16-18; Pg. 23 Lines 9-Pg.24 Lines 15).

Undesirable shift phenomenon forecasting means as presented in specification (Pg.30 Lines 18-21; Pg. 23 Lines 16-23).

Algorithm correcting means for correcting the shift control algorithm as presented in specification (Pg. 30 Lines 21- 22; Pg. 26 Lines 18-Pg. 27 Lines 29).

Regarding Claim 12-13 and 15-17

Claim 12 also discloses a system similar to claim 1 and uses language uses “mean for” language. The reasons for allowance of these claims are similar to claims 1 and 7.

Regarding Claim 18-23

Claim 18 discloses a method for simulating a shift control algorithm for an automatic transmission. Hong teaches Step (a) inputting the shift control algorithm (Hong:

Pg.109, Abstract) and step (b) inputting the input the hydraulic pressure supply command and estimating the effective hydraulic pressure (Hong: Pg.113, "AT Controller Module", Pg.109 3rd Paragraph and AT module). Iizuka teaches step (c) transfer function as "hydraulic pressure correction value setting portion 31" to converge with estimated hydraulic pressure (Iizuka '188: Col.6, Lines 42-49; Col.4 Lines 16-22). Iizuka teaches step (d) as method for simulating shift control algorithm for converged automatic transmission system (Iizuka '188: Fig.1, Elements 26 & 13). The third model is obvious as combined or converged first and second models generate a converged hydraulic pressure (functionally the output of the third model).

Although the claimed steps are taught and/or would be obvious to one skilled in the art Iizuka as pointed out by applicant is not a simulator having two models and no third model is generated from the two models. *These features relating to the specific sequence of method steps as noted above renders the claimed invention non-obvious over the prior art of record.*

Regarding Claim 24-28 and 29-30, 32-34

Claim 24 discloses similar limitations as claim 7 without means for language and would be allowable for the same reasons as claim 7 because the *features relating to the specific sequence of method steps as noted renders the claimed invention non-obvious over the prior art of record.*

Claim 29 also discloses method steps, while the steps are taught by Hong, Iizuka and Yoon are obvious to one skilled in the art, the *features relating to the specific*

sequence of method steps as noted renders the claimed invention non-obvious over the prior art of record.

The prior art article "Design of Computer Experiments for Open-Loop Control and Robustness Analysis of Clutch to Clutch Shifts in Automatic Transmission" by Albert Yoon et al (Yoon hereafter): Yoon only teaches extracting parameters, but lacks the sequence as presented in the method steps.

Regarding Claim 35

Claim 35 discloses a real time shift simulation model-system with CAD based design program for simulating the shift control algorithm for an automatic transmission.

Such simulation systems are known in the art as Hardware-In-Loop-Simulation (HILS) systems. The combination of the prior art (Hong, Iizuka and Yoon) do not teach real time shift simulation model. Further search revealed a HILS real time shift simulation model of power-train as described below.

The article "Vehicle Modeling and Simulation in the Duisburg Mechatronics Laboratory" by D. Adamski et al (No date). Section 6 teaches simulation of the HILS real time simulation of the ECU but the disclosure is limited and lacks date.

Further, the prior art do not teach the arrangement of elements as required by the claim, rendering the claims non-obvious.

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Regarding Claim 36

Claim 36 discloses a method for simulating a shift control algorithm for an automatic transmission. As shown in claim 18 Hong and Iizuka teach the limitations however the specific sequence of steps are not found in the prior art and would be allowable for the reasons presented in claim 18.

The prior art article "Design of Computer Experiments for Open-Loop Control and Robustness Analysis of Clutch to Clutch Shifts in Automatic Transmission" by Albert Yoon et al (Yoon hereafter): Yoon only teaches extracting parameters, but lacks the sequence as presented in the method steps.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled **"Comments on Statement of Reasons for Allowance."**

Other Relevant Art

7. **"Adams/CAR Templates"** show template for modeling the powertrain system of a car however there is no disclosure for the real time simulation.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Akash Saxena whose telephone number is (571) 272-8351. The examiner can normally be reached on 9:30 - 6:00 PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini S. Shah can be reached on (571)272-2279. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Akash Saxena
Patent Examiner, GAU 2128
(571) 272-8351
Tuesday, March 27, 2007



FRED FERRIS
PRIMARY EXAMINER
TECHNOLOGY CENTER 2100

Fred Ferris
Primary Examiner, GAU 2128
Structural Design, Modeling, Simulation and Emulation
(571) 272-3778